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09/164,517	09/30/1998	JIE LIANG	TI-26414AA	6766

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EXAMINER
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WU, JINGGE

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 17

Application Number: 09/164,517  
Filing Date: September 30, 1998  
Appellant(s): Liang et al.

**MAILED**

SEP 1 8 2002

Technology Center 2600

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Carlton H. Hoel  
For Appellant

**EXAMINER'S ANSWER**

This is in response to appellant's brief on appeal filed August 6, 2002.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

The rejection of claims 1-20 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CAR 1.192(c)(7).

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

The following is a listing of the prior art of record relied upon in the rejection of

claims under appeal.

6141446	Boliek et al.	10-2000
5442458	Rabbani et al.	8-1995
5357250	Healey et al.	10-1994
5703646	Oda	12-1997
5901251	Rust	3-1999

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims.

***Remarks***

1. Applicant's arguments with respect to claims 1-7 regarding the filing date of US 6141446 have been fully considered, but they are not persuasive. The reference is a CIP of US 5966465 filed on May 3, 1996. The parent reference, US 5966465, has all the limitations the examiner used to reject claims 1-7, e.g. bitplanes and context model (col. 23) and arithmetic coding (col. 24 lines 57-67) etc. Therefore, the effective filing date of US 6141446 to Boliek can be viewed as at least as early as May 3, 1996, which properly renders Boliek as prior art.

***Claim Rejections - 35 U.S.C. § 103***

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6141446 to Boliek et al. ("Boliek") in view of U.S. patent 5442458 to Rabbani et al. ("Rabbani" a reference of record).

As to claim 1, Boliek discloses a method of encoding an image, comprising:

a) decomposing an image into bit plane(col. 20 lines 51-57); and

b) arithmetic encoding the bitplanes with a context model from the neighboring bits in a bitplane (Fig. 3 and 4, col. 10 line 57-col. 11 lines 39, col. 30 lines 7-17, and Fig. 37 col. 27 lines 41-65).

Boliek does not explicitly mention using the previous bit at the location in previous bit plane for the context model which is well known.

Rabbani, in an analogous environment, discloses the step of arithmetic encoding the bitplanes with a context model from the neighboring bits in a bitplane and previous bits at location in previous bitplanes (Fig. 3 col. 4 lines 49-67 and col. 5 lines 40-68).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the previous bit plane in the context model of Rabbani in the method of Boliek because it is desirable to obtain the optimal probability model based on the context and the efficiency for real time application (Rabbani, col. 1 lines 25-35). By using the scheme of Rabbani, the context for a coefficient contains more information about probability models of the coefficient so as to obtain efficient entropy compression of the coefficient so that the compression ration of the method is improved.

3. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Boliek and Rabbani, further in view of U.S. patent 5357250 to Healey et al. ("Healey").

As to claim 2, Boliek further discloses the decomposition includes:

a) wavelet transform the image into a hierarchy of coefficients and bitplanes are of transform coefficients (col. 20 lines 46-67, col. 30 lines 7-17, and col. 27 lines 41-65) but does

not mention the forgetting factor for adaptive context statistic determination which is well known in the art.

Healey, in an analogous environment, discloses that the arithmetic coding includes a forgetting factor for adaptive context statistic determination (col. 6 lines 13-54 and col. 9 lines 49-55).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the forgetting factor of the arithmetic coding in the method of Boliek because it is desirable to efficiently encode the data stream (Healey, col. 7, lines 36-47 and col. 9 lines 55-59). By using the scheme of Healey, the context model based on probabilities sets as a function of the past bits occurrences so as to obtain efficient entropy compression of the coefficient so that the compression ratio of the method is improved.

As to claim 3, the combination of Boliek, Rabbani, and Healey does not mention choosing forgetting factor is 127.

However, choosing the length of the forgetting factor is a designing choice based on the computing power and practical requirement of projects.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the forgetting factor 127 in the method of the combination of Boliek, Rabbani, and Healey because it is desirable to obtain the optimal probability model based on the context for fast encoding (Healey, col. 7, lines 36-47 and col. 9, lines 55-59). By using the forgetting factor, the context for a coefficient would contain a class of distributions integrated with regard to a prior distribution so as to obtain efficient entropy compression of the coefficient so that the compression ratio of the method is improved.

4. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Boliek and Rabbani, further in view of U.S. patent 5703646 to Oda.

As to claims 4 and 5, the combination of Boliek and Rabbani does not mention I, P, B frames and bi-directional motion compensation which is well known in the art.

Oda, in an analogous environment, discloses I, P, B frames and bi-directional motion compensation (Fig. 5, col. 20 lines 25-55) as well as wavelet transforming the I frame (col. 22 lines 15-16).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the wavelet compression for the I, P, B frames of Oda in the method of Boliek and Rabbani in the series video because it is desirable to obtain high quality image with complicated patterns in high speed encoding (Oda, col. 6 lines 31-43). By using the scheme of Oda, the quality of pictures as well as transmission speed of the method is improved.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Boliek and Rabbani, further in view of U.S. patent 5901251 to Rust.

As to claim 6, the combination of Boliek and Rabbani does not explicitly mention simple and natural images and choosing the context model accordingly.

Rust, in an analogous environment, discloses the steps of :

a) the decomposition of the image into bitplanes includes a partition of the image into simple (text/line art) and natural (pattern) portions (col. 11 lines 7-24); and

b) the arithmetic coding uses different context modes for the simple and natural image portions (col. 5 line 52-col. 6 line 4 and col. 9 line 43-col. 10 line 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the adaptive arithmetic coding based on different context model of Rust in the method of Boliek because it is desirable to use arithmetic coding adaptive to the

context for better compression (Rust, col. 3 line 33-col. 4 line 4). By using the scheme of Rust, the arithmetic coder adaptively uses context models for obtaining efficient entropy compression of the coefficient so that the compression ration of the method is improved.



**(11) Response to Argument**

(A) The following discussion relates to the rejection of claims 1-7 under 35 U.S.C. §103 as being unpatentable over Boliek et al. in view of Rabbani et al.

1. Appellants' arguments -- Appellant argues that the rejection all rely on the Boliek patent (US 6,141,446) which has filing date as the same as that of the present application. Thus, "the Boliek patent is not a reference.", and "the Examiner did not make any rejections using USP 5,966,465" (parent patent of the Boliek patent) "in place of USP 6,141,446, and the pending rejections are insufficient." (Page 3, paragraph 3).

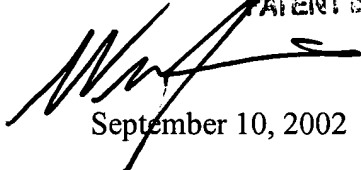
Examiner's response --The Examiner does not agree with Appellant. All limitations in the claim 1 such as bitplanes, context model, and arithmetic coding etc. are disclosed in both the Boliek patent and its parent patent US 5,966,465 to Keith et al.. Furthermore, some of the cited portions (Boliek, col. 27 lines 41-65) of Boliek by the Examiner are directly related to Keith (Boliek, col. 27 lines 26-41). Moreover, other cited portions of Boliek (Boliek, col. 20, lines 51-57, col. 30 lines 7-17, col. 20 lines 46-67, col. 10 line 57-col. 11 line 39,) by the Examiner in the final rejection are either exact same language as that disclosed in Keith (Keith, col. 20, lines 3-13, col. 24, lines 57-67, col. 19 line 65-col. 20 line 19) or substantially same language respectively (Keith, col. 9, line 66-col. 10 line 46). Therefore, the Examiner's rejection relies on only teachings have been disclosed in the parent case Keith. The effective filing date of the Boliek patent can be viewed at least as early as May 3, 1996, which renders Boliek patent as a proper prior art. Since Boliek is a sufficient reference, the Examiner does not have to use the parent patent Keith in replace of Boliek.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted

Jingge Wu

JINGGE WU  
PATENT EXAMINER



September 10, 2002

Appeal Conferees:

Jon Chang



Amelia Au

